

**Award Number: Contract #: W81XWH-11-2-0100; Proposal #10071010**

**TITLE: The Temporal Relationship Between Intrafamilial Violence, Deployment, and Serious Mental Illness in US Army Service Members**

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**PRINCIPAL INVESTIGATOR:**  
David Rubin, MD, MSCE

**CONTRACTING ORGANIZATION:**  
The Children's Hospital of Philadelphia  
PolicyLab  
34<sup>th</sup> Street & Civic Center Blvd  
CHOP North – Suite 1500  
Philadelphia, PA 19104  
(215) 590-3815

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**REPORT DATE: March 27, 2015**

**TYPE OF REPORT: Annual Report**

**PREPARED FOR: U.S. Army Medical Research and Materiel Command  
Fort Detrick, Maryland 21702-5012**

**DISTRIBUTION STATEMENT: Approved for Public Release;  
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REPORT DOCUMENTATION PAGE				Form Approved OMB No. 0704-0188	
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1. REPORT DATE 03/27/2015		2. REPORT TYPE Annual		3. DATES COVERED 18 FEB 2014 to 17 FEB 2015	
4. TITLE AND SUBTITLE The Temporal Relationship Between Intrafamilial Violence, Deployment, and Serious Mental Illness in US Army Service Members				5a. CONTRACT NUMBER W81XWH-11-2-0100	
				5b. GRANT NUMBER 10071010	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) David Rubin, MD MSCE; Christine Taylor  E-Mail: Rubin@email.chop.edu				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Children's Hospital of Philadelphia 34 <sup>th</sup> St & Civic Center Blvd CHOP North—Suite 1500 Philadelphia, PA 19104-4318				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Medical Research and Materiel Command Fort Detrick, Maryland 21702-5012				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION / AVAILABILITY STATEMENT Approved for Public Release; Distribution Unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT Prior research has established an association between deployment and family violence, with insufficient evidence to identify when such violence occurs in relation to deployment and identification of mental illness in ADASM. This project is currently using: 1) longitudinal models to capture the temporal relationships between deployment, mental health identification, and family violence and 2) longitudinal data to identify child maltreatment reporting trends. The current study findings highlight differential child maltreatment risk across deployment periods and suggests possible points for interventions to facilitate successful reintegration and family stability across the deployment cycle. Our analyses characterizes risk for child maltreatment reports and medical diagnoses of maltreatment across not only deployment type, but also injury type and source of care. Ongoing analysis will explore risk for maltreatment given mental health identification as well. We are preparing to analyze mental health diagnoses by deployment period and concurrent medication use among ADASM only so as to better understand the mental health patterns in this particular population. Exploring when ADASM are diagnosed with mental health problems relative to their deployment(s), and what increases the likelihood of a PTSD diagnosis among soldiers will help our team describe patterns of diagnoses leading up to an eventual PTSD diagnoses, and possibly child maltreatment episodes.					
15. SUBJECT TERMS Family Violence, Mental Illness, Health Services Research					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT U	b. ABSTRACT U	c. THIS PAGE U			USAMRMC
			UU	11	19b. TELEPHONE NUMBER (include area code)

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Title: The Temporal Relationship Between Intrafamilial Violence, Deployment, and Serious Mental Illness  
in US Army Service Members  
PI: Rubin, David M.  
Report: Annual Report #4, Year 4-5, March 27<sup>th</sup>, 2015  
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## CLINICAL RESEARCH ANNUAL TECHNICAL PROGRESS REPORT (USAMRAA)

### **(a) Grant/Cooperative Agreement number and title**

Proposal #10071010; Contract #: W81XWH-11-2-0100

Proposal Title: The Temporal Relationship Between Intrafamilial Violence, Deployment, and  
Serious Mental Illness in US Army Service Members

### **(b) Type of report, sequence number of report, and period of performance being reported**

Annual Report #4 (Q1-Q4 of Y4/5), February 18, 2014 to February 17, 2015

### **(c) Recipient's name, address, and telephone number**

Angela M Martinelli, RN, PhD, CNOR  
Captain, U.S. Public Health Service  
Science Officer  
Congressionally Directed Medical Research Programs  
1077 Patchel St.  
Fort Detrick, MD 21702  
301-619-4500

### **(d) Principal Investigator name, address and telephone number**

David Rubin, MD, MSCE  
The Children's Hospital of Philadelphia  
PolicyLab  
3535 Market Street, 15th Floor  
Philadelphia, PA 19104  
(215) 590-3815

### **(e) Date of publication**

March 27<sup>th</sup>, 2015

### **(f) Grants Officer's Representative name**

Lance Nowell

## SECTION I - INTRODUCTION

The last decade has been one of considerable stress to families of soldiers, who have sustained a 10-year combat effort involving prolonged, sequential deployments. The resulting deployment tempo created unique stressors on military families. While evidence suggests that military families themselves are not at increased risk for intrafamilial violence during peacetime, there is evidence that: (1) cycles of deployment may increase this risk; (2) this risk could be encumbered by the soldiers themselves, or by the spouse who is left behind to care for the family's needs; and (3) while prior data has demonstrated a cross-sectional association between deployment and intrafamilial violence, there remains a great need to understand the temporal relationships, the specific personnel at greatest risk, and how such information can lead to better targeting of preventative resources.

This proposal offers a mixed methods approach to better appreciate the challenges faced by military families, as well as potential strategies that will support them and thereby reduce the risk for intrafamilial violence that may be associated with deployment. An observational analysis (Stage 1) will determine the temporal relationships between deployment, mental health issues, and intrafamilial violence within military families, and evaluate the risk differences between soldiers with different roles and responsibilities. To be clear, this proposal does not seek to identify whether there is an association between deployment and intrafamilial violence. Rather, we will further advance the military's understanding of this association by identifying the temporal relationships between deployment and intrafamilial violence as well as discovering how other factors mediate and moderate this relationship. With this analysis, we can identify specific subgroups of families that are at greatest risk for intrafamilial violence and the timeframe in which their risk is greatest. In this way, policies within the Army can help to target resources more effectively to families at highest risk, moving away from a "one-size fits all" approach.

For the observational analysis, we will link personnel and deployment history with healthcare claims data and substantiated reports of spousal and child abuse. The team will pursue longitudinal analyses to:

- 1) Establish the temporal relationship between deployment, diagnosis of mental illness in soldiers and spouses, and events of intrafamilial violence.
- 2) Identify specific factors that may modify the temporal relationship, including individual factors (i.e., demographics, soldiers' prior health, unit, MOS), family factors (i.e., family size, compositing, family members' prior health history), and deployment factors (i.e. length, frequency, timing between, and role during)

To build upon those results, the team will then pursue a community-driven approach via qualitative study (Stage 2) in which targeted leadership and stakeholders within the Army will be asked to reflect on the results from the observational study, based on expertise and past experiences within the system, to provide structured feedback that will guide suggestions for future interventions. This mixed methods format offers the best approach to linking quantitative analyses with concrete stakeholder recommendations in order to develop appropriate interventions that can be feasibly implemented. For the qualitative study, we will create a structured qualitative approach that will emerge from Stage 1 findings and, with guidance from our Army advisors, which allows community experts/stakeholders from within the Army to:

- 1) Provide a rich contextual interpretation of the findings generated in Stage 1.
- 2) Solicit recommendations from Army stakeholders that will enhance the successful implementation of future interventions arising from Stage 1 findings.

## **SECTION II KEYWORDS**

### Keywords

Child maltreatment, deployment, Family Advocacy Program, child abuse, family violence, mental health, reporting

## **SECTION III – SUMMARY OF PROGRESS DURING YEAR 3**

### Personnel

None

### Human Subjects Approvals

The study team submitted and received approval from the CHOP IRB for the annual continuing review of the protocol. Additionally, we received Continuing Review approval from the USAMRMC ORP HRPO.

### Key Partnerships

Over the past year, we continued to collaborate with groups and individuals whose expertise have added to the value, and the direction of the study in particular. These include Department of Defense Family Advocacy Program (FAP) leadership, COL Cox, Dr. Robichaux, and Dr. Gable from the Army FAP, and partners across the Presidential Commissions to Eliminate Child Abuse and Neglect Fatalities. They add valuable input surrounding FAP reporting process and policy relevant discussion. The team will continue to build and strengthen our relationship with the Family Advocacy Program as we disseminate results in the next year and look forward to future work. Likewise, we have built a strong relationship with the Office of the Surgeon General, which has been instrumental in planning future dissemination strategy.

### Enhancing our security standards

No modifications to our security standards have been made.

### Data Acquisition

The past reporting year marked the completion of the data acquisition phase for our team.

### Data Preparation and Analysis

The completion of the final working dataset marks a significant milestone for the data team. Our analyses datasets have built over the past year as we begin to answer our research questions.

The team conducted primary analyses using the completed longitudinal dataset. Using select data, we analyzed the relationship between child- and family-level maltreatment events and deployment, mental illness, and specific diagnoses for Post-Traumatic Stress Disorder(PTSD)/Traumatic Brain Injury(TBI) and likely PTSD. Some of these analyses are still in process. In addition, we are preparing to analyze mental health diagnoses by deployment period and concurrent medication use among service members only so as to better understand the

mental health patterns in this particular population. Exploring when soldiers are diagnosed with mental health problems relative to their deployment(s), and what increases the likelihood of a PTSD diagnosis among soldiers will help our team describe patterns of diagnoses leading up to an eventual PTSD diagnoses. To do this, we will be looking at several deployment- and demographic-related factors and how they contribute to the risk of developing PTSD. Finally, we plan on exploring the temporality of mental health diagnoses and child maltreatment events among the families in our cohort.

To date, the team has completed two separate analyses; one focusing on child maltreatment events binned into deployment periods, and the second describing medical diagnoses of child maltreatment and reports to the Family Advocacy Program(FAP). For the longitudinal look at child maltreatment events and deployment periods, we limited the analysis to soldiers with 0-2 deployments. For each deployment period, maltreatment rates were calculated as the observed number of maltreatment episodes divided by the number of child-months. P-values comparing rates in different exposure periods were obtained assuming a Poisson distribution. Those results by deployment period are displayed in Figure 1 and 2. In Figure 1 below, the vertical axis shows the rate of child maltreatment in episodes per 10,000 child-months of exposure. The horizontal axis is the deployment periods of the soldier. In Figure 2 below, the vertical axis shows the rate of child maltreatment in episodes per 10,000 child-months of exposure. The horizontal axis is the deployment periods of the soldier.

To better understand reporting trends and the overlap between medically diagnosed maltreatment events and substantiated reports in the Family Advocacy Program data, we conducted a descriptive analysis at the child maltreatment episode-level. If the date of the FAP report occurred within a window one month before or after the date of the maltreatment episode, then the maltreatment episode was categorized as being linked to a substantiated FAP report. The associations between the rate of linkage and the child-level, soldier-level, and source of care-level factors were examined using Chi-square analysis. Those preliminary reporting trend results are included in the Conclusion section below, and displayed in Table 1 by installation level categories.

Most recently, the team is in the process of re-coding our injury algorithm and corresponding datasets to improve the accuracy of reporting associated child injuries with maltreatment events. Using this data, we will re-analyze the relationship between child- and family-level maltreatment events and deployment, mental illness, and prescription drug use associated with mental health illnesses.

Following this algorithm revision, the team will going back to the individual level and focus on dependent children of soldiers, starting at observable birth during the study period (2001-2007). We are in the process of conducting a survival, recurrent event analysis among this group. The survival analysis base model follows children from birth to 24 months and explores time to child maltreatment events given deployment and mental health of the associated soldier. For the medical diagnoses outcome, the risk for hospitalization due to maltreatment goes down as children get older, so we will not follow children past 24 months. In this analysis, deployment and prior soldier characteristics and experiences are treated as a time-varying co-variables, and all events prior to child birth will be considered additional co-variables. We also plan to extend this analysis out past 24 months when focusing on FAP reports due to the fundamental differences between the two outcomes. The same co-variables will apply.

### Conclusion:

In terms of reporting trends, our preliminary findings show that among the 245,349 dependent children aged 0-2 years in our study cohort, 17.8 per 1,000 children received a child physical abuse diagnosis. The preliminary findings also show that among the 4,367 child victims observed during the study period, there were 5,532 medically diagnosed child abuse episodes, and only 19% of all child abuse episodes had a substantiated report in the Family Advocacy Program data. Following the injury code revision, we will be able to more accurately pinpoint the source of initial service (inpatient, outpatient, and emergency department care) for each child victim, and the injury types associated with those episodes of abuse. In addition, before 2008, PII was not retained by the Family Advocacy Program for all unsubstantiated reports so we interpret these findings with the context of that limitation. The results suggest potential under-reporting of child maltreatment to FAP that may be related to 1) cases that may be reported directly to local or state civilian CPS instead of FAP; 2) subsequent failure to communicate from civilian officials (i.e. child protective services) to FAP; and/or 3) failure to communicate from military providers to the appropriate services or reporting point of contacts (RPOC).

Building on our earlier findings that children whose parents are deployed more than once are at higher risk for maltreatment during the later deployment, we restricted the analysis to those children with a sponsor deployed either once or twice during the study period. The rates for those deployment periods followed the same trends identified in the cross sectional analysis in that children are at an increased risk for child maltreatment during the soldier's second deployment, and an elevated risk immediately following (in the first 6 months following) deployment among children of soldiers deployed once during the study period. Current and ongoing analyses will expand on these preliminary trends in terms of mental health, deployment, and injury and abuse type.

### Supporting Data:

**Table 1. Rates of Child Maltreatment Reporting across Installations**

Source of Care (p<0.001)	All Injury Episodes <sup>b</sup> , % of total episodes (n=322,327)	All Abuse Episodes, % of total abuse episodes (n=4,367 <sup>a</sup> )	Abuse Episodes with a FAP Report, % within installation (n=887)
Large U.S. Installations with Large Medical Facilities	8.7	10.2	20.0
Large U.S. Installations with Medium Size Medical Facilities	17.8	16.8	36.8
Large U.S. Installations with Small Medical Facilities	19.1	17.7	18.8
Small U.S. Installations with Small Medical Facilities	24.0	23.1	21.1

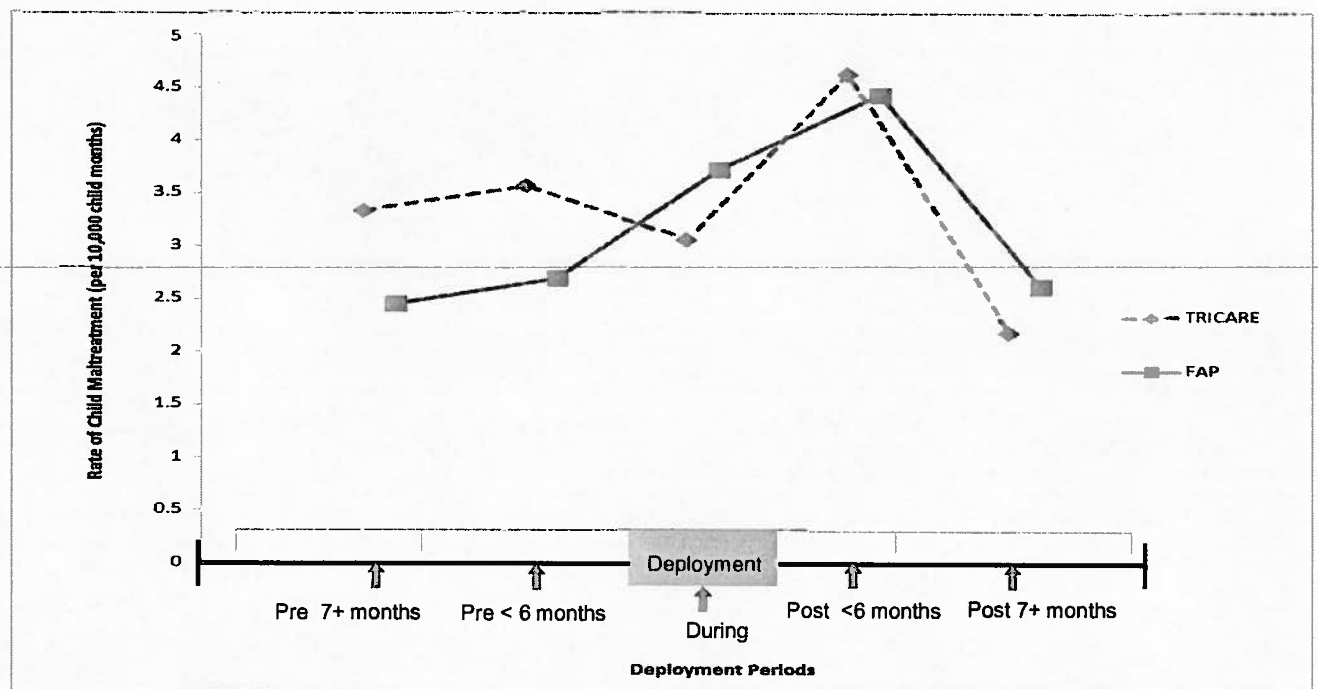


Installations Outside U.S.	5.1	20.8	26.5
Non-Military Catchment Areas	25.4	9.7	13.0

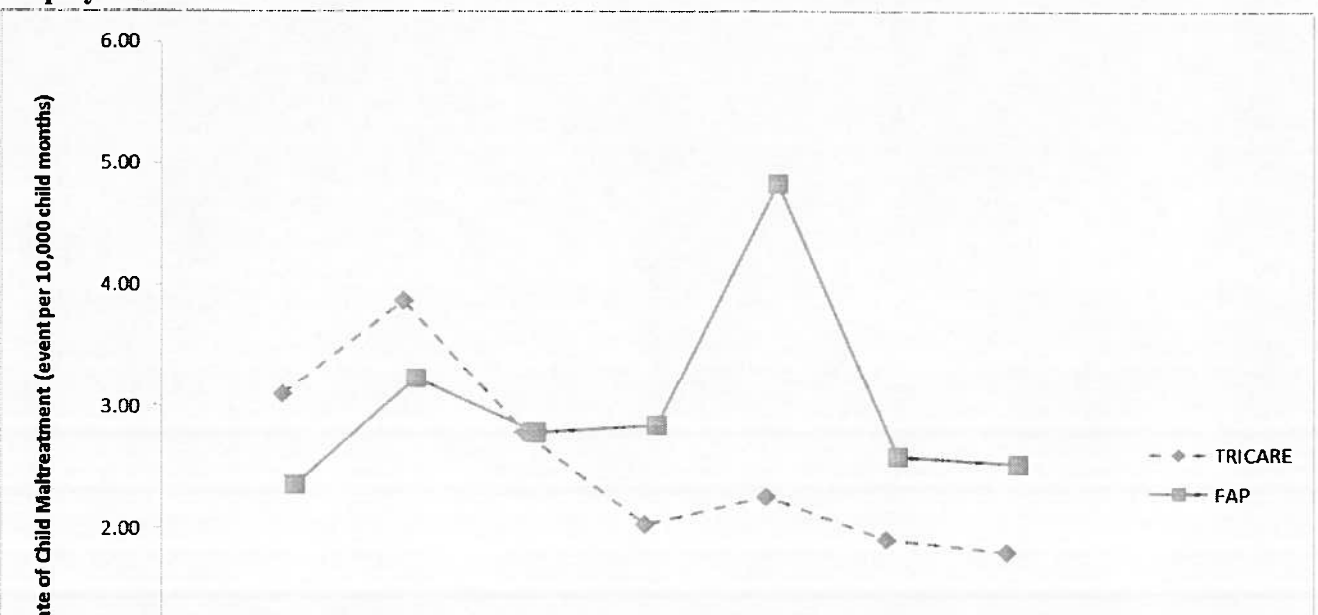
<sup>a</sup> The installations represented in this table account for 78.9% (n=4,367) of the total child maltreatment episodes observed during the study period (n=5,532).

<sup>b</sup> This category represents all medical claims observed over the course of the study period, not limited to abuse-related diagnoses.

**Figure 1; Rate of Child Maltreatment by Deployment Periods Among Children of Soldiers Deployed Once:**



**Figure 2; Rate of Child Maltreatment by Deployment Periods Among Children of Soldiers Deployed Twice**



## SECTION IV – CHANGES/PROBLEM AREAS

- (a) A description of current and recent problems that may impede performance along with actions being taken to resolve them:

Given the approaching end of project date, we anticipated needing additional time to finalize the primary analysis. We drafted a 6-month extension without funds proposal, and it was recently approved.

- (b) A description of anticipated problems that have a potential to impede progress and what corrective action is planned should the problem materialize:

The plans for future analysis include examining the relationship between spousal violence and service member deployment periods. During this phase, our team will encounter the same sampling obstacles that we currently experience with the child cohort. Our resolution will be to conduct a weighted sample matched on service member rank, age at entry to the study, race, education level, and sex of service member.

## Section V- PRODUCTS

Publications, Abstracts, and Presentations

### Peer-Reviewed Scientific Journals

**\*Under peer review** Taylor CM, Ross ME, Frioux SM, Wood JN, Griffis HM, Harb GC, Mi L, Song L, Lynch KG, Rubin DM. Maltreatment of Infants and Toddlers during Deployment Periods of Active Duty Army Soldiers. *In peer review with: American Journal of Public Health*

### Abstracts and Presentations

**August 2015** Psychiatric Diagnoses in U.S. Soldiers: The Identification of Mental Health Problems Relative to Soldier Deployments. Harb GC, Taylor CM, Griffis HM, Ross R, Lynch KG, Rubin DM. *To be presented at: Military Health Research Symposium*

**June 2015** Protecting Our Nation's Military Children: Reporting of Child Abuse and The Direction of Future Policy. Taylor CM, Wilson L. *Presented at: One Child, Many Hands: A Multi-disciplinary Conference on Child Welfare at The Field Center for Children's Policy, Practice, and Research; Philadelphia, PA.*

**April 2015** Underreporting of Physical Abuse Among Children of Army Soldiers to the U.S. Army Family Advocacy Program. Taylor CM, Wood JN, Griffis HM, Frioux SM, Lynch KG, Rubin DM. *Presented at: Pediatric Academic Society 2015, San Diego, CA.*

**SECTION VI - DESCRIPTION OF WORK TO BE PERFORMED DURING THE NEXT REPORTING PERIOD.**

<b><u>3<sup>rd</sup> Quarter Year 3 Goals (from Revised SOW)</u></b>	<b><u>Status</u></b>
Primary analysis (Y1Q2-Y3Q2)	In process; survival analysis in process; analysis of mental health by deployment periods in process;
Prepare summary report of quantitative findings (Y3Q3-Y3Q4)	In process; abstract to PAS accepted; manuscripts under revision; manuscript submitted
Develop partnerships with key community stakeholders (Y1Q1-Y4Q4)	In process;

**SECTION VI - ADMINISTRATIVE COMMENTS (OPTIONAL)**

None.

**CDMRP Contacts:**

**Email:** lance.l.nowell.civ@mail.mil

**Email:** angela.m.martinelli.mil@mail.mil